

Michigan

Summary and Analysis

Michigan policymakers envision the development of green industries as a potential solution to the state's ongoing economic woes. Those hopes, coupled with significant investment during the last five years at the state and local levels, are beginning to produce some significant results.

With the Big Three automakers based in Detroit, Michigan has a head start over other states in developing clean fuels and cars, because it can piggyback off existing automotive research, manufacturing, and supply capacities. At present, more than 40 percent of the state's green jobs are in the transportation and fuel sector. Governor Jennifer Granholm has successfully pursued billions of dollars in federal support for green and energy efficient vehicles for Michigan. The state is positioned to become a global leader in the production of electric vehicles and batteries. Michigan has also targeted wind energy manufacturing as an area of potential strength. Multiple wind farms may eventually be built off the shores of the Great Lakes, though existing proposals are meeting with stiff local resistance. Some sources have cautioned that without a stronger renewable portfolio standard, lack of demand may cause Michigan to lose the competition for wind manufacturing to states, like Ohio, with more progressive energy goals. State and local officials agree there is a need to raise Michigan's standard above 10 percent moving forward. Michigan stills gets most of its electricity from coal, and unemployment remains staggering, but state and local leaders have implemented a number of innovative programs aimed at promoting green development, including:

- The statewide No Worker Left Behind program provides up to \$10,000 in tuition support for laid-off workers and has trained over 130,000 workers since 2007.
- The governor has linked economic development and environmental policy in the Department of Energy, Labor, and Economic Growth.
- Massive public investments are being made in tax credits to attract green energy manufacturers, including portions of the \$1 billion 21st Century Jobs Fund and the \$800 million Michigan Advanced Battery Credits.
- In Grand Rapids, city officials have pledged to obtain 100 percent of municipal electricity needs from renewable sources by 2020.

Grand Rapids is emerging as a national leader in green building, education, and business development. The greening of the city's image and economy is in large part thanks to strong regional organization and collaboration. Local companies have banded together in the West Michigan Sustainable Purchasing Consortium to bid down prices for green supplies. The Community Sustainability Partnership has allied more than 190 local governments, educational institutions, businesses and nonprofits to promote sustainable growth.

General Background Policy

Energy Goals. In 2007, Michigan joined the Midwestern Regional Greenhouse Gas Reduction Accord, which commits the state to 10 percent renewable energy by 2015. That benchmark was codified as part of a comprehensive energy plan passed in 2008 (SB 213, HB 55214). In addition to establishing the state's Renewable Portfolio Standard, the legislation includes a net metering provision, consumer tax credits for energy-efficiency and renewable-energy projects, and a requirement that the state's two large electric utilities increase efficiency 5.5 percent by 2015. Those utility companies are also required to invest in renewable electricity generation. Consumers Energy must add 200 megawatts from renewable sources by 2013 and a total of 500 megawatts by 2015, and DTE Energy must build or buy 600 megawatts by the same date (NextEnergy 2008). Those investments are being funded by a monthly surcharge on consumer electric bills. Finally, the package of bills called for state government buildings to reduce their electricity consumption 25 percent by 2015 (DSIRE 2010). Investments in energy efficiency are expected to save the state \$3 billion over twenty years (BLMISI 2009). Governor Jennifer Granholm has been pushing the legislature to adopt the aggressive goal of a 45 percent reduction in the use of imported fossil fuels (which would include all coal burnt in the state) by 2020. The Michigan Climate Action Council, a planning group formed at the governor's behest, recommended in their 2009 final report that the state enact policies to reduce greenhouse gas emissions 20 percent below 2005 levels by 2020 and 80 percent by 2050.

Many in policy circles feel Michigan's 10 percent renewable energy goal is not aggressive enough, especially because the state's major utility companies had already achieved about half of that goal before the legislation was passed. "The RPS is a modest commitment to renewable energy at best," said Arn Boezaart, Director of the Michigan Alternative and Renewable Energy Center at Grand Valley State University. "Michigan was twenty-eighth in the nation to develop a renewable portfolio standard, so we didn't exactly lead the pack" (Boezaart 2010). Greg Main, president and CEO of the Michigan Economic Development, admitted that the existing renewable portfolio standard is insufficient, but said he has been in talks with the governor about trying to increase those targets (Main 2010).

The state's investor-owned utility companies get paid by the kilowatt-hour, so they have little incentive to invest in clean energy or efficiency. Unlike California and a few other states, Michigan does not have decoupling of utility revenue from efficiency gains. While the utilities have been accused of dragging their feet on renewable energy, they have not been entirely unresponsive to state demand. Consumers Energy has launched an experimental program to buy electricity from small residential solar installations. Under the new program, the utility would purchase all of the electricity produced by the residential system, and the residence would continue to receive its electricity from the grid. In order to be eligible for the program, the solar equipment used must have been manufactured or assembled in Michigan, and participants are not eligible for net metering. Grand Rapids sustainability director Haris Alibasic said he would like to see greater support for feed-in tariffs at the state level. The existing Consumers' program is capped at 2 megawatts and is already 300 percent oversubscribed (Alibasic 2010).

Public Benefits Fund. Michigan electric consumers pay a system benefits charge that supports the Low-Income and Energy Efficiency Fund, which is administered by the state's

Public Service Commission. The fund receives about \$84 million annually for projects, and a total of more than \$488 million in grants had been awarded by the end of 2009. Although the focus is on low-income customers, the fund supports general energy-efficiency projects and has even supported feasibility studies for off-shore wind generation (DSIRE 2010).

Green Building Policy. In 2005, Governor Granholm signed Executive Order #2005-04, which required new and renovated state government buildings, including those at universities, above \$1,000,000 to be LEED-certified at the minimum level. The order also mandated a reduction in energy consumption by executive branch buildings of 10 percent by 2008 and 20 percent by 2015, with both goals using 2002 as the baseline year. Additional executive orders in 2007 (#2007-06, #2007-22) increased the reduction in energy consumption by an additional 10 percent. Legislation passed in 2008 (PA 295) increased the reduction in purchases from the grid to 25 percent (DSIRE 2010). The state legislature (SB 1111-1114) is considering bills that would provide tax breaks to construction or renovation projects that meet LEED standards.

Green Jobs Training. Faced with an army of unemployed workers, Michigan has taken a unique approach to jobs training, investing heavily in several marquee programs such as No Worker Left Behind and the Michigan Skills Alliances. Since its launch in August 2007, the \$500 million No Worker Left Behind program has helped more than 130,000 laid-off or impoverished Michiganders receive additional training in high-demand professions. The program provides up to \$10,000 in tuition support for each participant. Twenty-five regional Michigan Works! agencies determine what kinds of jobs are in high demand in their area, and they compile a list of eligible training programs. Individuals receiving unemployment benefits are steered to No Worker Left Behind through local Michigan Works! service centers, and the workers can choose to enroll in any of the approved training programs, which range from associate's degrees and certificates to post-graduate studies at four-year universities. Nearly 60 percent of unemployed workers who finished their training were able to find a new job — three times the national average (State of Michigan 2010). Unfortunately, federal spending cuts are drying up the stream of funds to the program, and local Michigan Works! offices have begun limiting the number of new applicants. Some observers have also complained that the program needs to put greater emphasis on training workers in emerging sectors, such as advanced energy, rather than focusing on existing areas of high demand. To address the need for more training in green industries, No Worker Left Behind was expanded in 2008 with the creation of the Green Jobs Initiative. The initiative earmarked \$6 million for green education and training programs, \$3 million of which went to tuition support for individual trainees.

State officials increasingly attempt to partner with industry in order to identify skills gaps and worker training needs. This new approach led in 2004 to the establishment of the first Michigan Skills Alliances, regional working groups that connect employers with educational institutions to address the workforce needs of a particular industry. The state provides seed money of \$250,000 over four years to help establish new alliances. To date, about forty alliances have been created throughout Michigan, with greater attention being paid to green industries in recent years. One success story has been the Michigan Academy for Green Mobility, which in 2008 brought together representatives of the auto industry to discuss strategies for training their engineers to build greener cars. After identifying their training needs, the alliance solicited proposals for training programs from state universities, and eventually settled on short courses in

advanced battery technology developed by Wayne State University and Michigan Technological University. In 2009, the state Department of Energy, Labor and Economic Growth secured funds from the Green Jobs Initiative for the first 200 engineers to complete the courses. For their part, companies like General Motors pitched in with equipment and facilities, such as vehicles and test tracks, for use in the courses, and covered some of the cost for a second cohort of trainees. The alliance is now looking at expanding the course offerings to a full certificate program.

A variety of other training programs in clean-energy industries has been started at state universities and community colleges. Weatherization certificate programs such as those at Henry Ford Community College in Dearborn and the WARM Training Center in Detroit have been attracting unemployed residents, but graduates are having a hard time finding work. Although Michigan secured \$234 million in ARRA funds to weatherize low-income homes, those funds have been slow to materialize, and as a result weatherizing businesses have not been hiring (Rogers 2010).

Clean-Energy Industries

General Policy. Between 2000 and 2010 Michigan lost about one million out of five million jobs, and it became the fiftieth state in the country for unemployment. The desperate employment situation set the stage for government investment in the high-technology sector, which soon broadened into the clean-energy industries. A 2009 report claims that Michigan already has more than 100,000 “green” jobs in the private sector, with ample opportunity for growth. The state’s Department of Energy, Labor, and Economic Growth projected jobs in green industries to grow by 6.4 percent annually from 2006-2016. Renewable energy jobs grew 30 percent between 2005 and 2008 (State of Michigan 2009). A Pew study recorded more modest gains (22,674 “clean” jobs in 2007 at 1,932 businesses) but still found that clean jobs were growing at more than 10 percent a year while the rest of the state’s economy is in decline (Pew 2009).

The Department of Energy, Labor, and Economic Growth distributes funds to industry for jobs training, but the first stop for most businesses looking to expand is the Michigan Economic Development Corporation (MEDC). An arm of state government, the MEDC has a hat full off tax incentives that can be used to lure green businesses — the decades-old Michigan Economic Growth Authority tax credits, Renaissance Zones for renewable energy, and brownfield redevelopment tax credits among them. The state has also been awash in federal stimulus funds. The MEDC recently selected the growth of alternative energy clusters as a focus of its business recruitment activities. Wind energy, photovoltaics, and cellulosic biofuels have been identified as target areas for investment. In addition to making green businesses eligible for various pots of government honey, the agency now employs dedicated business development managers to work with companies in sectors such as wind and solar energy, and it is even airing a new commercial in which actor and native son Jeff Daniels pitches Michigan as the “Eco-Peninsula.”

At the heart of Michigan’s economic development efforts is the 21st Century Jobs Fund, authorized by the state legislature in 2005. The 10-year, \$1 billion fund invests tobacco

settlement dollars in the state's high-tech economy, with alternative energy as an area of special emphasis. MEDC President Greg Main called the fund an essential aspect of the state's economic development strategy, but other sources have been more critical of the program's performance. For example, *The Detroit Free Press* recently reported that the hundreds of millions already spent under the program have only netted about 1,000 direct jobs, about one-third of the number initially predicted by the state (Yung 2010).

The state government has also created a program to develop further Michigan's research infrastructure. The Centers of Energy Excellence program was launched in 2008 to encourage "the development, growth, and sustainability of alternative energy industry clusters in Michigan by identifying and/or locating a base company in a geographic region with the necessary business and supply-chain infrastructure" (Brown 2008). The program utilized up to \$45 million over three years from the 21st Century Jobs Fund to support research and development clusters. One of the first centers steered \$3 million to a University of Michigan professor to fund both research and her Ann Arbor startup. A related law passed in 2006 and amended in 2008 enabled the state to establish up to fifteen Renewable Energy Renaissance Zones, in which companies that produce renewable energy are exempted from most state taxes. As of August 2009, four such zones had been approved (DSIRE 2010).

The state is using some of the ARRA funding it received to support clean-energy manufacturing. In 2009 the state awarded five grants to help small manufacturers retool for production in renewable energy or components, and in 2010 the state gave another \$20 million to nine businesses. Applicants had to show demand, local sourcing (within Michigan), proof of contribution to the state's renewable portfolio standards goals, recycling of waste, and compliance with the prevailing wage laws (Foshay 2010). One well-known example of the retooling of Michigan's industrial base is a factory in Wixom, where the Michigan Economic Growth Authority helped Ford to repurpose an automotive plant, which at its height employed 5,000 workers, to house renewable energy companies (Donoghue 2009).

Several other tax incentives have been put in place to attract businesses in clean-energy industries, and a variety of incentives exist for residential property owners to pursue renewable energy or efficiency projects as well. The Michigan House of Representatives recently passed a bill that would allow communities to issue PACE bonds for residential projects, which homeowners would slowly repay through additional property taxes.

Governor Granholm also reorganized the state's Department of Labor and Economic Growth into the Department of Energy, Labor, and Economic Growth (DELEG) to link the state's economic development efforts with energy policy. The new department's activities include clean-tech industry development, and green jobs training initiatives. Prior to the reorganization, work to promote sustainable development had been underway in a handful of state departments with little inter-departmental cooperation. According to DELEG staff, gathering all of these resources under one banner has improved communication among state officials and allowed for greater coordination of their activities.

The state government in 2007 founded the nonprofit organization NextEnergy and capitalized it with \$30 million in seed funding from the MEDC. The organization both funds

research on advanced energy technologies and facilitates their commercialization. It supports business development in the biofuels and electric motor vehicle industries, as well as the use of the automotive supply chain to develop wind turbine component manufacturing and battery technology.

In 2007, the state's three large research universities received almost \$80 million in grants to conduct alternative energy research. More than half of the funded projects concerned transportation and fuel technologies. Michigan universities have established a variety of offices and centers for coordinating clean-energy research and facilitating technology transfer, including the Michigan Memorial Phoenix Energy Institute at the University of Michigan, Michigan State University's Office of Biobased Technologies, and Wayne State University's Center for Automotive Research (Anderson Economic Group 2008).

Biofuels. Michigan has targeted biofuels production through its Renewable Energy Renaissance Zones program, which stipulates that five of the fifteen zones to be established focus on producing cellulosic fuels (DSIRE 2010). In 2005 an executive order from the governor (2005-4) required state agencies to purchase hybrid and alternative fuel vehicles (EPA 2008). In 2006 Michigan developed a program to assist service station owners with converting their pumps to include biofuels, and in the same year NextEnergy established the National Biofuels Energy Laboratory at Wayne State University. The laboratory helped to develop the national standard for biodiesel that will enable a transition from a 5 percent to 20 percent blend. A year later Michigan State University shared a \$50 million grant to found the Great Lakes Bio-energy Research Center, in partnership with the University of Wisconsin-Madison, for advanced studies on cellulosic ethanol production. The creation of that center helped to forge an agreement with the Boston-based Mascoma Corporation to build a cellulosic ethanol plant in Michigan. In 2009, Michigan State University opened its Bioeconomy Institute at a 138,000 square foot facility in Holland, Michigan. The institute aims to facilitate technology transfers by providing space for business incubation and laboratory research on biofuels, materials and chemicals.

Michigan policymakers are also searching for ways to take advantage of the state's biomass resources. Waste from the paper and lumber industries and untapped stock in the state's vast northern forests have the potential to supply a large biomass industry, but the industry has so far been slow to develop.

Solar. Michigan has expanded in the solar industry, due to its demand side policies and its economic development efforts. The state has the natural resource of North America's largest silicon deposits near Saginaw. 2008 legislation set aside \$75 million for tax credits to companies creating jobs in photovoltaics manufacturing in hopes of strengthening the state's growing solar cluster. The state government's efforts have paid off to some degree, because Michigan is now home to a number of solar equipment manufacturers. Hemlock Semiconductor, a subsidiary of Dow Corning, is a leading producer of solar-grade polycrystalline silicon, and the company is investing \$2 billion into an expansion of its solar business. United Solar Ovonic (also called Uni-Solar) is a leading global photovoltaic firm that has its headquarters in Michigan. The company makes thin, flexible solar films and has four production plants in Michigan, two near Detroit and two near Grand Rapids. Though the company's cutting-edge technology has garnered significant media interest, production has outpaced sales during the current economic

downturn, and Uni-Solar's bottom line has suffered, even to the point of forcing temporary worker furloughs in 2009.

Transportation and Energy Storage. Given Michigan's historical position as the home of the automotive industry, it has built on that strength to establish leadership in the electric vehicle, battery technology, and fuel-cell industries. State officials are betting that the country's transition to cleaner energy sources will make advanced batteries ubiquitous, both for grid storage and electric vehicles. The Michigan Advanced Battery Credits Program was recently expanded to \$800 million in tax credits for battery manufacturing. According to Governor Granholm, this support for the industry will enable Michigan to be "the place to locate if you are a battery manufacturer" (Luke 2009).

Michigan's courtship of the battery industry appears to be paying dividends, because six new battery manufacturing facilities have located there, and state officials are currently in talks to bring in two more companies. This success is in part thanks to the governor's close relationship with the Obama administration. In just the last two years, the state has received about \$6 billion in both private and public funds for new battery manufacturing facilities, including sizeable allocations of federal stimulus money (Schneider 2010). In 2009 Michigan received more money than any other state from the \$2.4 billion Electric Drive and Vehicle Component Manufacturing Initiative (U.S. Department of Energy 2009), and \$1.35 billion in ARRA funds to support twelve projects in advanced battery and electric vehicle manufacturing (Brown 2009).

As of mid-2009, four companies — Johnson Controls, Dow Chemical, LG Chem, and A123Systems — had pledged to invest almost \$2 billion building four battery plants in Michigan. The facilities were expected to create 6,600 jobs (Environmental Leader 2010). The Massachusetts-based A123Systems has since opened a second factory and will begin construction on a third in 2010. Efforts are also being made to grow a supply chain for the battery industry within the state's borders.

Michigan now has one of the largest stakes in worldwide electric vehicle manufacturing, and the state's battery and energy storage industries are projected to employ 62,000 people by 2010. The state claims that the multiplier for an auto industry job is ten to one (ten indirect and induced jobs are created for every automotive job), and four to one for automotive supply chain jobs. At a conference presentation that Hess attended, a representative from the state government characterized Michigan's electric vehicle industry as "real," in contrast with California's electric vehicle industry, which he characterized as "toy cars" built in "garages." The Obama administration's implementation of tough new fuel efficiency standards is priming the market for the huge number of gas-sippers that will soon be churning out of Detroit. Both General Motors and Ford selected Michigan as the site for building their first electric vehicles. The much-hyped Chevy Volt is scheduled to hit showrooms by the end of the year, and Ford plans to release five different electric models by 2012.

Michigan also has some strengths in the related industry of hydrogen production. The state is home to the DTE Hydrogen Technology Park, which provides testing for on-site hydrogen use from production and storage to use, and to the NextEnergy Center, which has

conducted hydrogen vehicle testing. All three of the major U.S. automotive companies, as well as some of the suppliers, have some research and development in fuel-cell vehicles. Manufacturers include Delphi, Adaptive Materials, and Energy Conversion Devices. There is also a fuel-cell research center at Kettering University and a laboratory at the University of Michigan. Five of the state's leading research universities formed the Consortium for Advanced Manufacturing of Alternative and Renewable Energy Technologies to advance energy technology research collaborations.

Wind. Michigan has several advantages over other states in growing its wind energy design and manufacturing sector. In addition to being a windier-than-average state (the American Wind Energy Association ranks it seventeenth nationally), its more than 3,000 miles of Great Lakes shoreline makes it an ideal place for investment in offshore wind farms. The state already has about 150 megawatts of wind capacity operating onshore, mostly in its southeastern "thumb" region.

In 2009 Governor Granholm established the Great Lakes Wind Council to identify wind energy sites, including offshore sites in the Great Lakes. Because much of the renewable energy produced from the state's 2008 Renewable Portfolio Standard is from wind energy, the goal is to utilize the development of wind farms to stimulate the state's wind manufacturing industry (North Carolina Solar Center 2009). Some observers have criticized the state, which owns the bottoms of the lakes, for not taking a more aggressive approach to developing offshore wind.

While offshore farms are still three-to-five years away from operational status, a number of Michigan wind technology firms are ramping up production in the anticipation of increased demand. A report by the MEDC counted at least twenty-five companies in the state involved in the manufacturing of wind turbines or turbine components, and another 900 firms are dedicated to designing, assembling, or providing other services related to the production of turbines. Michigan's economic development organizations hope that as automobile production continues to shrink, the state's many parts suppliers will be able to replace their disappearing business with contracts to make components for wind turbines, which require many of same building blocks as cars, such as gears, bearings and engines. In 2009, twenty-nine different parts suppliers successfully competed for \$377 million in new business (NextEnergy 2010).

Existing businesses include Danotek Motion Technologies, which makes generators for wind turbines; Ventower, which builds wind towers; and Loc Performance Products, which manufactures the systems that control the direction a windmill is facing. Each firm expects to add dozens of jobs in the coming years (Greene 2010). Because manufacturing quality remains a problem area for the turbine industry, Michigan businesses hope to trade on their expertise with casting technologies to manufacture more reliable turbine parts, and state officials have been courting a leading Swedish casting firm.

In 2008 Michigan was ranked as a top state, along with Iowa and Wisconsin, for expanded or new wind manufacturing operations (American Wind Energy Association 2009). Global Wind Systems is planning a \$30 million turbine manufacturing plant in Novi that will employ more than 400 people, and GE has announced it will add a design center in Detroit (Sanchez 2010). Michigan has established an incentive that rewards renewable-energy producers

who use equipment manufactured within the state. The state energy office has prepared model zoning guidelines to assist municipalities with the development of codes for commercial wind farms and residential installations (DSIRE 2010).

Grand Rapids

The West Michigan region, anchored by the city of Grand Rapids, is one of the few bright spots on Michigan's economic map, as the prospects for Detroit and much of the rest of the state continue to sag from dependence on the flailing auto industry. Investment in the Grand Rapids area has taken off, and the budding metropolis has increasingly been able to attract green industry. Green building throughout the region has gone, in some cases quite literally, through the roof. These successes have in part been stimulated by the forward-thinking policies of local leaders. In May, the U.S. Chamber of Commerce Civic Leadership Center named Grand Rapids the most sustainable mid-sized city in the U.S.. "We're at a tipping point of behavioral change," said Norm Christopher, executive director of the Sustainable Community Development Initiative at Grand Valley State University (Christopher 2010).

But the city government's impressive commitment to sustainability is almost certainly not the root cause of the accelerated greening of Grand Rapids in recent years. Rather, it is the effect of a community-oriented culture unique to the region. Local leaders like to say that the conservation ethic has a long history in Grand Rapids; a Protestant ethic has probably been equally operative. The region has traditionally been home to a large Dutch Protestant population, and that heritage has infused the captains of Grand Rapids industry with an uncommonly strong sense of civic and environmental responsibility. Local billionaires have invested heavily in the city and surrounding area, and today's sustainability initiatives can trace their origins back to environmental organizing begun by members of the business community in the late 1960s.

Government, business, and educational leaders have displayed a remarkable aptitude for bringing people together and generating consensus. The formation of public-private partnerships, large stakeholders' groups, and voluntary collaborations between business competitors is almost old hat here. "We collaborate and work together like we're a community of 10,000, yet we're a metro area of nearly 800,000. That is something very different about West Michigan," said Tim Mroz, vice president of marketing and communications at The Right Place, Inc. "The level of collaboration around sustainability is unlike anywhere else in the nation – I challenge you to find another community that brings citizens, government, and private business together like we do" (Mroz 2010).

Sustainability Plans. Grand Rapids has some of the most aggressive renewable energy goals in the nation. By late 2007, a 2005 benchmark of obtaining 20 percent of municipal government power needs from renewable sources had already been met. The city commission has embraced Mayor George Heartwell's new goal of obtaining 100 percent of the city government's energy from renewables by 2020. The city remains in the exploratory phases of determining how to meet this goal. The 20 percent mark was reached by simply buying renewable energy from Consumers Energy, the region's dominant utility. The increased cost of that electricity was offset by improvements in energy efficiency at a water filtration plant near

Lake Michigan, which by itself accounts for a quarter of the city's electricity use. Other solutions will have to be devised in order to meet the remainder of the goal, since Grand Rapids has already bought up most of Consumers Energy's existing renewable energy capacity. City officials have been in talks with two developers to build wind farms in West Michigan, and they have been trying to install two 2.2 megawatt turbines at the Lake Michigan filtration plant, but those plans have so far been stymied by opposition from lakeshore residents who do not want turbines obstructing their views.

Energy conservation is a central aspect of the city's sustainability plans. From 2008-2009, city government reduced its energy consumption by 3.8 percent. A goal has been set of making city facilities 10 percent more efficient by June 2015. As a signatory of the Great Lakes and St. Lawrence Cities Initiative, the only inland city so far to sign the agreement, Grand Rapids has committed to reducing its water usage by 15 percent below 2000 levels. In 2009 city officials developed a comprehensive energy-efficiency and conservation plan, which took a detailed account of current energy use by the city government and laid out strategies for reducing consumption. The plan recommended spending approximately \$2 million on mostly simple fixes, such as replacing windows and thermostats. The projects would largely be paid for with federal block grants awarded through the stimulus, and would save the city almost \$150,000 annually in energy costs.

Grand Rapids has also created an Office of Energy and Sustainability, hired a sustainability director, and formed a Renewable Energy Team on the city commission. The city's five-year sustainability plan, released this June, identifies numerous targets such as reducing carbon emissions by 10,000 metric tons no later than 2013, building 100 miles of bike lanes by 2014, and increasing green and local purchasing 25 percent by 2015 (city of Grand Rapids 2010).

Green-Building Initiatives. Grand Rapids boasts the most LEED-certified buildings per capita of any city in the country and the fourth highest number of LEED certifications overall, more than cities like Chicago and New York (Amway Insider 2010). That the West Michigan region has become a national leader in green building should perhaps come as no surprise; local furniture manufacturer Herman Miller was a founding member of the U.S. Green Building Council, and its "GreenHouse" building in Holland was used in 1995 as a model to help develop LEED certification standards.

Building to LEED standards has become the norm for new developments in Grand Rapids. According to Renae Hesselink, chair of the West Michigan chapter of the U.S. Green Building Council, the ongoing recession has not been able to slow the pace of green building in the region (Hesselink 2010). In 2006, the city adopted a requirement that all newly-constructed or renovated municipal buildings must qualify for LEED certification, so long as the buildings are 10,000 square feet or larger and the project's budget is at least \$1 million. The principles of LEED Neighborhood Development were also built into a new city zoning ordinance in 2008.

Mayor Heartwell has seen firsthand a shift in attitudes toward green building among local developers. Five years ago, those developers would more likely than not plead that meeting LEED standards was too expensive. Today, Heartwell says, proposals for new developments that

come before the city commission almost invariably include a commitment to obtain LEED certification (Heartwell 2010). Green building principles have permeated the development culture, and West Michigan benefits from an extensive talent pool of architects, builders and interior designers trained in applying LEED-friendly practices. All students enrolled in the construction trades program at Grand Rapids Community College are trained in green-building techniques. The greater Grand Rapids region has been reaping the rewards of this knowledge base, with a number of high-profile green buildings now completed or in development. A flashy new art museum opened in 2007 became the first in the world to achieve a LEED Gold certification. The museum's many energy-efficient features include significant use of natural lighting and a water collection and recycling system. Grand Valley State University will begin construction on a new \$70 million library, to be built to LEED Platinum standards, in 2011. Even employees of the local zoo have put their heads together in an effort to develop LEED-style standards for animal facilities.

Green Jobs Training. As discussed above with respect to green building, much of Grand Rapids' success in pursuing sustainability initiatives can be linked to the knowledge base that has been built there. In 2005, the United Nations University named Grand Rapids a Regional Center for Expertise on Education for Sustainable Development, making it the first city in the U.S. to receive such a designation. All of Grand Rapids' major institutions of higher education have made significant commitments to teaching sustainability and preparing students for jobs in the green economy. Aquinas College in Grand Rapids, where a LEED-certified library and the Center for Sustainability recently opened their doors, developed the country's first undergraduate program in Sustainable Business, and now offers a Master's Degree as well. The Center for Sustainability also offers professional certificates to local business managers and executives as one of its many community outreach programs. Although those efforts were spurred by donations from Steelcase and the Wege Foundation, center director Deborah Steketee says the campus has taken its newfound sustainability focus to heart, reducing energy consumption 19 percent, decreasing fertilizer use by 60 percent and pesticide use by 98 percent, and kicking off a number of student-led green initiatives (Steketee 2010b).

Grand Rapids Community College is using a \$4 million Pathways Out of Poverty grant to train at-risk individuals in personal energy-efficiency practices and the sorts of basic science skills needed for many green jobs. According to Julie Parks, director of workforce training at GRCC, the teaching of sustainability principles is now pervasive throughout the college's curriculum (Parks 2010). The same might be said about Grand Valley State University, where 13 percent of all student credit hours contain sustainability subject matter. GVSU was also one of the first schools in the nation to develop an undergraduate certificate program in green chemistry. The university has formed the departmental-level Sustainable Community Development Initiative to assess campus-wide practices, and has set the goal of becoming carbon neutral by 2037.

Green Business Initiatives. The Grand Rapids area is somewhat unique in that sustainability efforts have not just targeted local businesses; they started with business. Leadership came initially from the furniture industry, which organized to reduce the environmental impacts of their manufacturing practices and those of their suppliers. Such early

sustainability efforts culminated in the formation of the West Michigan Sustainable Business Forum in 1994, which now boasts around 100 area companies as members.

The “triple bottom line” model of measuring performance has gained widespread cachet in the Grand Rapids business community. Many firms have adopted the goal of improving environmental quality and social equity while growing profits, and go so far as to produce annual reports and web pages professing their commitment to “people, planet, profit” and documenting their progress. Community leaders will admit that while West Michigan has seen marked improvements on the economic and environmental fronts, the social equity piece of the puzzle remains a challenge. Unemployment remains high among poor and minority residents, as do dropout rates at city high schools. The region has witnessed some social justice successes; for example, reducing toxic pollution alone has social benefits. Plastics manufacturer Cascade Engineering has emerged as a standout in fulfilling triple-bottom-line principles through initiatives like its Welfare-to-Work program, which does just what it says, and its LEED-platinum corporate headquarters in Grand Rapids. Employee accidents, greenhouse gas emissions and costs are all down at the company (Cascade Engineering 2009). Nichols, a distributor of janitorial supplies, has also made triple-bottom-line inroads, achieving a LEED Gold certification for their Muskegon facility, diverting 148,000 tons of solid waste from landfills, and working in the community to build respect for custodial teams.

Decades after kicking off the sustainability movement in West Michigan, office furniture giants Steelcase and Herman Miller continue to set the bar high for other area businesses. Environmental stewardship is ingrained in the corporate cultures of both manufacturers. Herman Miller founder D.J. Depree first made it a company priority in the 1950s (Steketee 2010). The firm has had an Environmental Quality Action Team in-house since 1989, evaluating the companies’ environmental performance and producing monthly progress reports. Steelcase scion Peter M. Wege II has been preaching the gospel of “economicology” since the 1990s. Wege, now 90, has been a major driver of green building in Grand Rapids through his philanthropic foundation. Steelcase has switched to using more environmentally-friendly materials in products that account for about 80 percent of the company’s sales, which makes the furniture more attractive to offices seeking LEED certifications (Sanchez 2010b). Herman Miller recently reached its goal of obtaining 100 percent of the electricity the company uses, worldwide, from renewable sources. For competitors, the two companies have a remarkable history of partnering to work on sustainability initiatives and share best practices. In 2008, they teamed up with the Business and Institutional Furniture Manufacturers Association to create standards and a certification program for sustainable furniture products.

The region’s furniture manufacturers are not the only ones working together. As of April, the Community Sustainability Partnership has signed on more than 190 local governments, schools, businesses, and nonprofits in West Michigan to facilitate the flow of information and resources. The group has exhausted its planned three-year run, and will be meeting in the next year to decide whether the continuation of the forum or some new incarnation should be pursued. An outgrowth of the partnership has been the creation of the West Michigan Sustainable Purchasing Consortium, which allies area businesses to collectively negotiate with vendors for better prices on environmentally-friendly products.

Much of the push for sustainable development in West Michigan has been homegrown, but area leaders have also shown a talent for attracting new green firms of late. The region scored a major coup recently with the announcement of two new battery plants to be built in Holland, a short drive from downtown Grand Rapids. One plant will make power packs for the Chevy Volt, and combined the two facilities will cost more than \$600 million and generate almost 1,000 jobs (Schneider 2010).

Grand Valley State University has attempted to jump-start technology transfers in West Michigan with the founding of the Michigan Alternative and Renewable Energy Center in 2003. The Muskegon facility serves as a business incubator, research laboratory and distributed generation demonstration center. In typical West Michigan fashion, the 25,000 square foot building was constructed to LEED Gold standards and produces its own energy from wind turbines on the premises and photovoltaic roof tiles.

Other Cities

The Environmental Protection Agency recognized the City of Ann Arbor as one of the nation's top renewable energy users in 2009, with about 20 percent of the electricity usage at municipal facilities coming from renewable sources. This achievement is the result of the city council's 2006 goal of transitioning 30 percent of local government energy consumption to renewables by 2010 (DSIRE 2010).

Very little has been done at the local level to promote green investment in Detroit. The auto industry is showing signs of life and has been making massive investments in clean technologies, and numerous research and start-up ventures are located in the Greater Detroit area. But the developments are occurring without organized government support, and the city itself lags behind on most sustainability indices. A number of civil society organizations dedicated to sustainability, Detroiters Working for Environmental Justice and Greening Detroit, are active in Detroit, but their accomplishments have so far been limited mostly to urban community gardening and local foods initiatives. Deconstruction and salvaging of building materials and green business incubation is being supported by nonprofits on a small scale.

Civil Society Organizations and Policy

Both the Apollo Alliance and Blue-Green Alliance are active in Michigan, and they have been advocates of many of the reform measures discussed above. The "ReEnergize Michigan" campaign calls for an increasing the renewable portfolio standard to 30 percent by 2025 and increasing the energy-efficiency standard to 2 percent per year. The campaign would also revise building codes for energy efficiency and enact a low-carbon fuel standard, and it calls for various protections for low-income households that are vulnerable to energy price increases and shut-offs (Progress Michigan 2010). The Michigan Sustainable Energy Coalition was formed in 2005 to push for the adoption of clean-energy production and sustainability measures, and the Michigan Environmental Council has been active on similar issues in addition to its broader conservation

and social justice efforts. Michigan organizations also support federal legislation that would provide tax credits and a revolving loan fund for companies that shift to clean-energy production.

The Grand Rapids business community has provided important leadership in developing the area's green consciousness, but not at the expense of grassroots involvement. Community engagement has long been one of West Michigan's strengths, and a number of civil society organizations have been active in organizing support for regional sustainability efforts. Founded in 1968 by environmental activist Joan Wolfe, the West Michigan Environmental Action Council remains heavily involved today, and through its Sustainable Communities programs the council is carrying out projects ranging from distributing energy-efficient light bulbs to promoting ecological values among religious groups. A group of about 400 individuals pulled together to form the West Michigan Strategic Alliance in 2000. The organization aims to promote collaboration throughout the region, with a significant emphasis on sustainability and green development. The alliance's many initiatives include efforts to increase the use of alternative fuels and to promote sustainable manufacturing practices. The Right Place, Inc, a regional economic development organization, recently hired two new staff members specializing in sustainability and advanced energy technology (Steketee 2010). Goodwill Industries International has an active branch in Grand Rapids, where the charity has built one of its first LEED-certified stores and is running a pilot green jobs training program.

For Additional Information

Green Jobs Michigan (<http://greenjobsmichigan.com>) provides up-to-date listings of job openings in green industries throughout the state. State news site [mlive.com](http://www.mlive.com) runs active sustainability and alternative energy sections under its West Michigan business section (<http://www.mlive.com/business/west-michigan/index.ssf/sustainability>), with regular updates on green developments in the greater Grand Rapids area. West Michigan business newspaper MiBiz publishes the online forum MiSustainable (<http://www.misustainable.com>), which features news articles, blogs, podcasts, white papers and a variety of other resources on sustainability initiatives throughout the region. State web sites tend to be poorly designed, but the "growth industries" section of the Michigan Economic Development Corporation's web site (<http://www.michiganadvantage.org/Targeted-Initiatives/Default.aspx>) provides useful summaries of government efforts to promote green economic development.

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